

## The American Psychological Society and Applying the Science of Learning

The American Psychological Society is strongly committed to federal efforts to develop a cadre of experts in mathematics and science, and to increasing the scientific literacy of the public at large. APS supports the goals of the Mathematics and Science Initiative through our initiative on "Applying the Science of Learning" which focuses on bringing what we know about how people think, learn and remember, and other cognitive, developmental and social factors that affect learning, into educational practice. Outcomes from this initiative will be an interdisciplinary research agenda for both applied and basic research along with a plan for assessing the effectiveness of educational innovations; an annotated bibliography by topical area, and prototypes to test plans to redesign education. Representatives of this program have briefed the White House Office of Science and Technology Policy, and testified before Congress. More information on the Applying the Science of Learning initiative can be found at <http://berger.research.claremontmckenna.edu/asl/>

Developing a research base is critical to the success of the Mathematics and Science Initiative. One core research question is "how does one develop expertise in a substantive area?" Questions about the development of expertise in domains of knowledge are of particular relevance to math and science education. Research in cognitive psychology and related fields has centered on the exact nature of expertise in an intellectual domain, as well as on how to design instruction in order to achieve expertise. For example, past research on expertise has yielded a significant understanding about the intuitive mental models that people use in conceptualizing such things as numbers and quantity, physical objects and processes, and biology and life. We also have extensive understanding of strategies for acquiring additional knowledge in a particular area. However, these and related areas of research must be pursued vigorously in order to address the many remaining questions about the cognitive, psychological, and social factors that influence the development of expertise in the areas of math and science.

More generally, APS is a strong advocate of federal support for education research, including the Institute of Education Sciences, the National Science Foundation, and the National Institutes of Health. At NSF, we are particularly supportive of their newest effort in education research, the establishment of the first Science of Learning Centers. NSF's program has two broad goals: improving our understanding of the learning process, and then transferring that understanding into application. The knowledge base and a critical mass of top-flight scientists are in place to help solve the educational and learning issues that have been identified by the government as high priorities. But getting that knowledge into the classroom is going to require a multi-disciplinary, multi-agency effort. This will be facilitated via investigations in human-computer interactions, cognitive psychology, cognitive neuroscience, and other activity related to child learning and cognitive development. Through the establishment of three or four multi-disciplinary Science of Learning Centers, NSF will for the first time attempt to focus the full range of science and research onto a scientific workforce objective. These centers will also provide a research base for the President's Math and Science Partnership.

We should also note that the APS journal, *Psychological Science in the Public Interest*, has recently featured two reports on education-related research. The first was a study of class size and its impact on achievement. The second examined psychological science and how it can inform the teaching of reading. More can be found on the APS website:

[http://www.psychologicalscience.org/journals/pspi/2\\_1.html](http://www.psychologicalscience.org/journals/pspi/2_1.html)

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